

## The Local Incidence of Epidemic Disease: the Case of Bristol 1540-1650

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As recent articles in *Local Population Studies* have suggested, the study of 'crisis mortality' is one of the more rewarding tasks for the student of population and one of the most valuable for the historian of pre-industrial societies. It is also an area in which the local historian has a vital role to play in collecting and interpreting the evidence. As Dr. Schofield has shown,<sup>1</sup> simple calculations of crisis mortality based on aggregative analysis of burial registers enable us to measure the relative severity of epidemic disease from parish to parish; and the local differences which emerge both illustrate the conditions in which disease flourished and point to broader social and economic variations from locality to locality. In the case of a large town with several surviving parish registers, we can even study these differences in mortality within a single local community and use them as one indicator of the varying quality of life in an early modern town. From this point of view the large number of parishes in several English towns, which in other circumstances hinders the work of the urban historian, becomes a definite advantage. The purpose of this article is to show the sort of conclusions and problems which may arise from work of this kind by means of one small case-study.

Sixteenth-century Bristol was both a major port and an industrial centre. With a population of about 11,000 it was one of the largest provincial towns, containing 18 parishes, 12 of whose registers survive.<sup>2</sup> (See Map Fig.1.) Inevitably a town of this kind suffered frequent outbreaks of plague and its civic annalists did not fail to record the fact. Epidemics were especially frequent at the beginning of the period. There was a 'plague of pestilence' in 1535, a 'great plague' in 1544-5 and 'the greatest mortality by pestilence in Bristol that any man knew' in 1551-2.<sup>3</sup> Parish registers can tell us nothing about the first, however, and only three registers for parishes in the centre of the town have entries for the others. But comparison of burials in the epidemic years with the annual average for a more normal period<sup>4</sup> suggests serious mortality (Table I).

Fig. 1 : Bristol

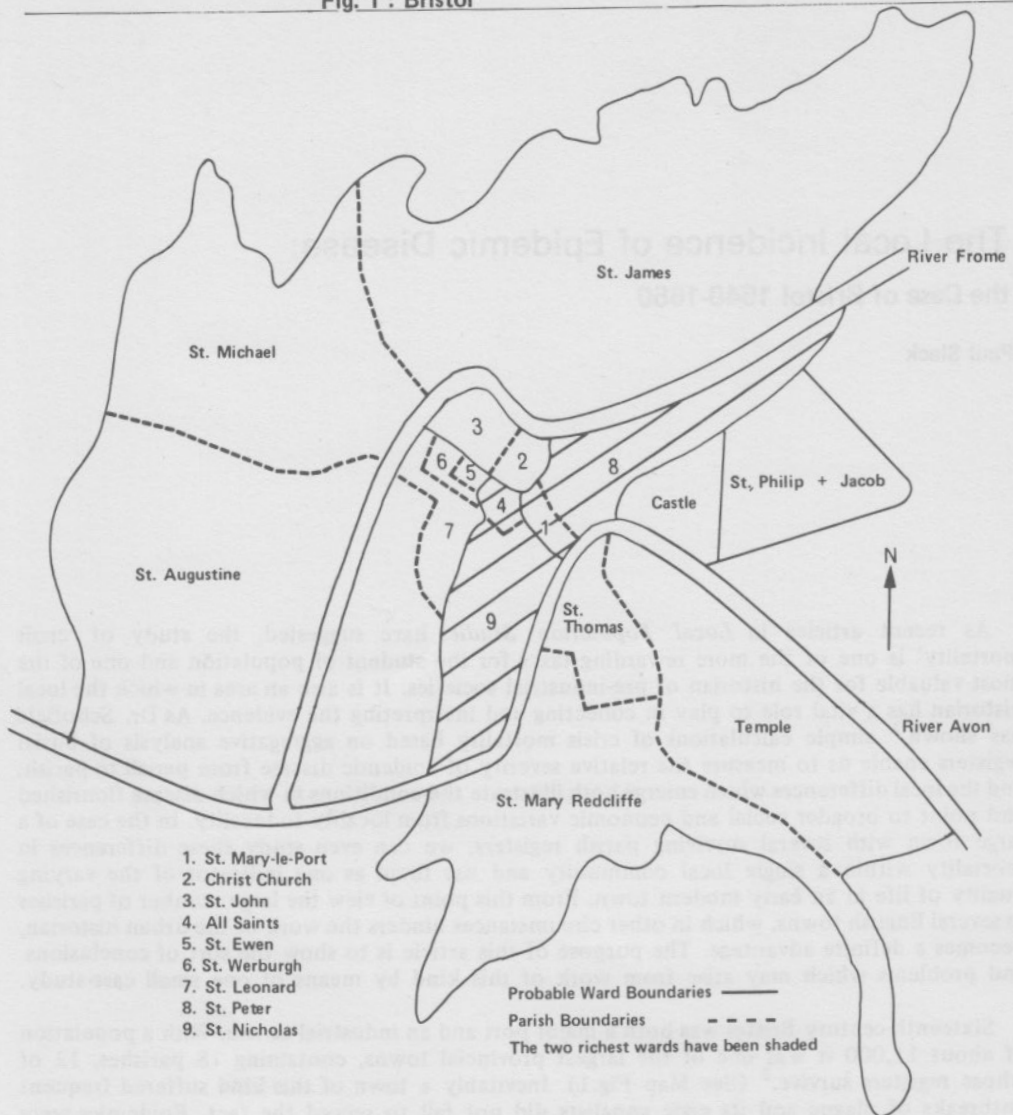


Table I

Parish	Annual Average Burials	Aug. 1544 - July 1545		1552	
	1539-43 + 1546-50	Burials	Ratio	Burials	Ratio
	a	b	b/a	c	c/a
St. Ewen	2.6	20	7.7	-	-
St. Nicholas	28.9	-	-	168	5.8
Christ Church	12.0	71	5.9	71	5.9

Between August 1544 and July 1545 burials in the parish of St. Ewen reached almost eight times the average, while in Christ Church and St. Nicholas's in the calendar year 1552 the number of burials was nearly six times the annual average. In St. Ewen's there were twenty burials in 1544-5, in a parish which in 1547 had only fifty-six communicants.<sup>5</sup> In each case the monthly distribution of burials, reaching a peak in the late autumn, would indicate an outbreak of bubonic plague, although the second epidemic was also preceded by a rise in burials in St. Nicholas's in July 1551, perhaps as a consequence of the 'sweating sickness'. The evidence is fragmentary, but two successive epidemics must have brought a crisis of major proportions to the central parishes of Bristol in these years.

There were three later better-documented outbreaks of bubonic plague before the civil war: in 1565, 1575 and 1603-4. Near-contemporary sources now provided figures for the total number of casualties. The plague of 1565 was said to have caused 2,070 deaths and that of 1575 2,000. For the 1603-4 epidemic, the chronicler claimed some statistical validity: the number dying between 18 July 1603 and February 1605 'according to the Church books and printed tickets' was '2,956, whereof of the plague 2,600'.<sup>6</sup>

Although these printed bills of mortality do not survive, it is possible to check the above figures with the registers of nine of the eighteen parishes of Bristol (shown in Table III below.) The chantry certificates suggest that these parishes contained rather less than two thirds of the communicants in the town. Since they included a large part of the suburbs, whose population may have been growing towards the end of the sixteenth century, this proportion is likely to have increased by 1603. But it can be used to provide a crude multiplier to convert the aggregate burials in the nine parishes into totals for Bristol as a whole. The totals arrived at are 1,800 for each of the calendar years 1565 and 1575, and 2,200 for the year from August 1603 to July 1604 when the plague had a noticeable effect on burials. Unlike similar assertions elsewhere, the figures presented in the Bristol annals do not seem to be grossly exaggerated. The total population of the town in 1547 has been put at roughly 11,000 and by 1603 it may have risen to 12,000.<sup>7</sup> In each of the three epidemics, therefore, the mortality rate may have been between sixteen and eighteen per cent.

There were no further major outbreaks of plague for nearly four decades after 1604. It is surprising that the epidemics in London in 1625 and 1636 were not duplicated later in Bristol as those of 1563 and 1603 had been, and the reasons for this are obscure. But it was

not the result of good management. Although watchmen were appointed at the gates and ships inspected on the quay,<sup>8</sup> the disease in fact entered the town. Houses had to be quarantined in St. Thomas's parish and Temple in 1626 and burials rose in other parts of the town in the plague months of the next three years.<sup>9</sup> Between 1637 and 1639 the disease was more serious, requiring a pesthouse for the infected and payments to the sick in Temple and St. Mary Redcliffe.<sup>10</sup> But the annual number of burials did not reach twice the average in any parish. In both the 1620s and 1630s there were apparently sporadic cases of plague over several years, as if the disease were temporarily endemic in the town, but no major epidemic developed.

Whatever the causes of this interlude may have been, it was brought to an abrupt end by the civil war and two sieges in succession. At the end of 1641 there was already 'sickness' among soldiers in the castle and by the summer of 1642 it had spread into several parishes around.<sup>11</sup> In 1643 when royalist armies besieged Bristol mortality increased still further, probably as a result of typhus. A parliamentary tract significantly complained that the soldiers who took the town in July infested their beds 'with lice. So that the houses where they quartered are like Goales (sic) for nastinesse'.<sup>12</sup> Two years later, during the second siege, there was an even more serious epidemic when bubonic plague returned.<sup>13</sup> In the two years 1643 and 1645 nearly 2,800 people were buried in ten parishes where the normal annual average was 310. We have no means of knowing what the population of these parishes was, but it cannot have been more than about 10,000. These epidemics together caused a more serious loss of population than any in the period, with the possible exception of the plagues of 1544 and 1552.

Outbreaks of bubonic plague in Bristol were thus irregular in their occurrence and extremely variable in their effect on mortality. Even more interesting and certainly less speculative than attempts to calculate gross mortality figures, however, are the variations which emerge between parishes and their apparent coincidence in many cases with social class differences. For plague mortality was not spread evenly over the town. In 1603-4, for example, burials rose to ten times the annual average in St. James's parish, yet to only 2.4 times the average in Christ Church. In order to appreciate the significance of such differences we must first try to rank the parishes in order of wealth. There are several possible ways of doing this, depending on available source materials. Local poor rate assessments may be used to compare the number of those receiving relief with the number of those contributing towards it, and the ratios from different parishes can be compared. Subsidy assessments for different parishes, especially those of the 1520s, might be used with the acreages of parishes or the number of communicants in the chantry certificates to provide a rough index of wealth per acre or per person in each parish. None of these methods is infallible; neither can they precisely reflect the social make-up of a parish in which there might be extremes of wealth and poverty. But when taken together and when applied to several towns in this period, they agree in suggesting a concentration of the wealthier classes in the central parishes of an urban community and the congregation of the poor on its outskirts or in its suburbs.

The evidence for Bristol, though in this respect less good than for some other urban centres, in no way conflicts with this broad generalisation. Unfortunately the subsidy assessments subdivide the town into wards and not parishes, but the 1524 assessment names the parish churches in each ward and it seems probable that most of the area of each parish fell in the same ward as its parish church. The calculations in Table II, comparing the 1524 and 1591 subsidy assessments<sup>14</sup> with the chantry returns, may then be used to show variations in

Table II Wealth of Bristol Wards

Wards	Subsidy assessment <sup>1</sup>		Parish Churches in 1524	1547 'houseling' people (c) ward total	Wealth	
	(a) 1524	(b) 1591			1524 a/c	1591 b/c
St. Mary-le-Port	1865	293	St. Mary St. Peter	580	3.2	0.51
All Saints	2867	588	All Saints St. Nicholas	980	2.9	0.6
St. Ewen	1961	258	St. Ewen St. Werburgh St. Leonard St. Stephen St. Lawrence	897	2.2	0.29
Holy Trinity	1733	404	Christ Church St. John St. Augustine St. Michael St. James St. Philip	1839 <sup>2</sup>	0.94	0.22
Redcliffe	932	274	St. Mary St. Thomas Temple	1680	0.56	0.16

1 To the nearest shilling.

2 There is no chantry return for St. Augustine's parish: this ward was therefore rather more populous and less wealthy than these figures suggest.

wealth between the rich central wards of St. Mary-le-Port and All Saints, and the poor suburb of Redcliffe across the Avon. These figures, however, must mask variations within wards and particularly in the large ward of Holy Trinity. Here it seems probable from the topography of the town and from later evidence that the central parish of Christ Church was closer to the neighbouring parishes of All Saints and St. Mary than to the suburban parishes of St. James and St. Philip in its social composition.<sup>15</sup>

Accepting these conclusions, the parishes may then be ranked roughly in order of wealth and the relative severity of the three outbreaks of plague after 1560 compared by means of ratios of epidemic to normal burials (Table III). It is immediately clear that variations in mortality do not exactly follow variations in wealth. Neither would we expect them to do so, since social class was not the sole variable involved. The disease was carried relatively slowly

Table III Bristol: Burials in the Plagues of 1565, 1575, and 1603-4 (Aug-July).

Parishes in approx. descending order of wealth.	1565			1575		1603-4		
	Burials	Normal Annual Average <sup>1</sup>	Ratio	Burials	Ratio	Burials	Normal Annual Average <sup>2</sup>	Ratio
	a	b	a/b	c	c/b	d	e	d/e
All Saints	32	3.8	8.4	16	4.2	18	4.8	3.8
St. Nicholas	122	23.4	5.2	157	6.7	124	25.4	4.9
St. Ewen	-	2.6	-	10	3.8	-	-	-
St. Werburgh	32	5.2	6.2	15	2.9	35	6.6	5.5
St. Stephen	164	22.9	7.2	197	8.6	188	33.4	5.6
Christ Church	93	12.6	7.4	99	7.9	45	17.6	2.4
St. John	93	10.7	8.5	60	5.6	113	11.1	10.2
St. Augustine	-	-	-	-	-	93	12.8	7.3
St. Philip & Jacob	-	-	-	-	-	302	35.2	8.6
St. Mary Redcliffe	209	24.1	8.7	217	9.0	277	34.6	8.0
St. James	170	20.8	8.2	160	7.7	310 <sup>3</sup>	30.3	10.2
Temple	201	20.4	9.9	221	10.8	263	30.8	8.5

1. For the years 1566-74, except for St. Ewen's where gaps in the register dictate the choice of the years 1576-83.
2. For the years 1593-1602.
3. These burials are given in St. James's register for 1664-5, but there is some confusion in the dating.

through the town by rats and its effects tended to be most serious in parishes infected before October when climatic conditions were most favourable for the development of an epidemic.<sup>16</sup> Nevertheless there is some significant correlation at the extremes. Taking the three epidemics together, bubonic plague was most violent in the parishes of St. Mary Redcliffe, Temple and St. James. The two former, together with St. Thomas's, comprised the poorest ward in the town, on the southern bank of the Avon where industrial suburbs had grown up in the later Middle Ages.<sup>17</sup> On the other hand the central parishes of All Saints, St. Nicholas and St. Werburgh were normally those least severely affected. The heavy mortality in All Saints parish in 1565 provides the only major exception. Apart from this, the incidence of plague would appear to be to some degree related to the distribution of wealth.

The vital determinants behind this association were of course variations in standards of housing and hygiene which might attract or repel the rats and fleas which carried plague. The central parishes of the town were certainly its most fashionable areas. By the end of the sixteenth century St. Werburgh's even included a street of stone houses, which may have been relatively rat-proof. In St. Mary Redcliffe the extremes of wealth and poverty met side



by side. There were some famous large merchants' houses, but this populous parish must also have contained many poor tenements.<sup>18</sup> The contrast between standards of hygiene in different parts of the town may have been even greater than variations in quality of housing, and also more important in determining the amount of contact between rats and men.<sup>19</sup> Visitors might praise the cleanliness of Bristol, with its paved streets and underground drains, a town 'where nothing is wanting....either for neatness or health'.<sup>20</sup> But such comments can have applied only to the central parishes. It is abundantly clear from presentments at the court leet that by the early seventeenth century the streets of Redcliffe ward were littered with decaying animal and vegetable matter. Conditions were so bad near St. Thomas's that 'people will hardly come to church by reason of the stench'.<sup>21</sup> In such an environment plague flourished.

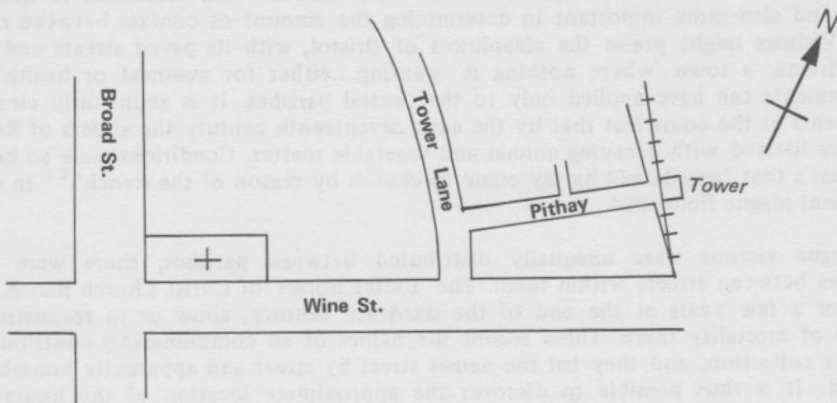
If plague victims were unequally distributed between parishes, there were similar differences between streets within them. The 'Easter Books' of Christ Church parish, which survive for a few years at the end of the sixteenth century, allow us to reconstruct the incidence of mortality there. These record the names of all communicants contributing to the Easter collection, and they list the names street by street and apparently household by household. It is thus possible to discover the approximate location of the houses from which most of those buried in the plagues of 1575 and 1603 came.<sup>22</sup> (Table IV and Fig. 2a and b). Wine Street and Broad Street were two of the main highways of the town, meeting at its centre, and they contained several large households, complete with servants and apprentices. But the 'Pithay' was a poor overcrowded alley leading to a workhouse in one of the towers in the walls. Although plague burials were scattered over a wide area and the disease moved haphazardly, sometimes missing out two or three households in its progress along a street, the Pithay lost a higher proportion of its inhabitants in both epidemics than any other part of the parish. This was especially so in the milder outbreak of 1603, but even in 1575 over half the burials in the first two months of the epidemic occurred here, and there were several others in the neighbouring houses of Wine Street. Bubonic plague was concentrated in the back street of this otherwise prosperous parish.

Table IV Christ Church Parish, Bristol: Communicants and Burials

Streets	Communicants listed at Easter					Burials <sup>1</sup>	
	1575	1576	1579	1601	1604	1575	1603
Broad St.	81	63	78	100	78	13	2
Wine St.	211	179	207	208	134	30	8
Tower Lane	46	36	32	27	27	4	1
The Pithay	71	60	68	79	67	26	24
Total	409	338	385	414	306	73	35
Unidentified burials:						19	7

1. Burials for the months June-Dec. have been taken in each case.

Fig. 2: Christ Church Parish, Bristol a) Sketch Map



b) Number of Burials in separate households 1575 and 1603 (June-December)

Broad St.  
East Side

1575				2				2			5	2			1	1	
1603			2														

Wine St.  
North Side

1575			2			1				1			1	1	1	6		4	1		
1603						1															3

Wine St.  
South Side

1575	1	1					2	3			1			1	2		1
1603			4														

Tower Lane

1575		1		1		1				1							
1603																1	

continued



continued

Pithay	1575	2		1		1				1	1	3		3	2		1	3	1	1	
? South Side	1603			1			3	1			1	3			5	4			1		

Pithay	1575	1				3		2	
? North Side	1603					2			3

Each square represents one household unit. Where the same household was afflicted in both 1575 and 1603 the squares have been joined.

The Easter Books also provide some evidence for the effect of plague on fluctuations of population in this parish. The Books of 1575 and 1576 suggest a radical fall in the number of communicants within one year. But not all of this decline was due to epidemic mortality and there were significant differences from street to street. The fall in the numbers for Wine Street and Broad Street was largely a consequence of the flight of the most prosperous householders, for several names occur in both the listings of 1575 and 1579 which are not present in that of 1576. In the Pithay, on the other hand, most of the absentees were in fact victims of the plague and by Easter 1576 a few poor families had already migrated into the street to fill the vacant tenements. Others followed them in the years before 1579. The Easter Book of 1604, when compared with the burial register and the Book of 1601, suggests that the next plague had an even more disparate effect on different streets. Nearly one third of the adults in the two main streets appear to have fled, while there were already several newcomers in the alley behind them. The total population of the parish changed little over the period, but the turnover was much greater in the Pithay than elsewhere. This small parish may well illustrate in microcosm the effect of plague in the rich and poor areas of the town as a whole.

Plague thus had a socially selective impact on Bristol in these years, and this is important for any understanding of its demographic and economic effects. But it must not be overstressed. No parish of the town entirely escaped the three epidemics between 1565 and 1604 and, as the Easter Books of Christ Church suggest, its movement from household to household might appear entirely random. Plague was a threat to a whole community, though not in reality of the same dimensions for all sections of it. Other epidemics provide instructive contrasts. A mortality crisis in 1597, which followed a series of bad harvests and was perhaps the consequence of diseases aggravated by malnutrition, affected only the poorer parishes of the town. Although the corporation arranged for the import of corn to combat the effects of scarcity,<sup>23</sup> the number of burials reached three times the average in the four parishes of St. John, St. Mary Redcliffe, Temple and St. Philip. Yet the wealthier parishes appear not to have been affected at all.<sup>24</sup>

Conversely, some periods of crisis mortality might affect the whole town indiscriminately. In 1643 the billeting of troops on Bristol in siege conditions spread disease, probably typhus, equally through all the parishes. Only Temple had significantly more burials than the others in 1643. Two years later, however, during the second siege which was accom-

panied by an epidemic of bubonic plague, there was a clear distinction between rich and poor parishes (Table V). In a town full of soldiers and in conditions of siege, even typhus, a disease normally associated with poverty, might be dispersed over the whole city.<sup>25</sup> But the

**Table V Bristol: Burials in 1643 and 1645**

Parishes in approx. descending order of wealth	Annual average no. of burials 1632-41 a	Burials 1643 b	Ratio b/a	Burials 1645 c	Ratio c/a
All Saints	8.2	24	2.9	14	1.7
St. Nicholas	39.0	114	2.9	88	2.3
St. Ewen	3.3	8	2.4	18	5.5
St. Werburgh	10.8	35	3.2	11	1.0
St. Stephen	47.1	134	2.8	226	4.8
Christ Church	24.1	69	2.9	-	-
St. John	21.3	75	3.5	89	4.2
St. Augustine	23.7	58	2.4	129	5.4
St. Philip and Jacob	56.3	77	1.4	-	-
St. Mary Redcliffe	59.4	184	3.1	466	7.8
St. James	51.5	169	3.1	416	8.1
Temple <sup>1</sup>	45.9	(240)	5.2	(372)	8.1

1. The register of Temple is badly mutilated, and figures taken from it are only approximate.

characteristic social incidence of bubonic plague remained. The epidemic of 1645 testifies even more clearly than its predecessors to the dependence of plague on rats and to its severity in areas where rats and men were in closest contact.

The history of plague in Bristol thus confirms the observations of contemporaries and the deductions which might be drawn from the disease's aetiology about its social incidence. It also raises associated problems which may be illuminated by similar work on other localities. For example, this evidence supports some of Professor Chambers' suggestions on the importance of the 'autonomous death-rate' in pre-industrial England.<sup>26</sup> Sporadic visitations of plague of unpredictable virulence were more frequent and more significant causes of crisis mortality in Bristol than fluctuations in food supplies. The dearth of the 1590s affected burials in only a minority of parishes and only the plague of 1552 seems to have been preceded by food-shortage in the town.<sup>27</sup> But as we have seen plague was not entirely 'autonomous' in its social incidence in urban communities. Hence it aggravated existing imbalances in health and mortality between rich and poor areas rather than creating new ones. Aggregative analysis shows that the ratio of baptisms to burials was greater in the central parishes of the town than in the suburbs even in normal years.<sup>28</sup> But the addition of crisis mortalities left poor parishes like St. Mary Redcliffe with a large surplus of burials over baptism over the whole period 1540-1650, while richer parishes like

St. Nicholas's still managed to produce a surplus of baptisms over burials. That the population of the poorer parishes did not decline before 1604 and even rose after that date, judging by the upward trend of baptisms and marriages, must be attributed to continuous and heavy immigration from rural areas. Plague thus exacerbated the particular character of urban suburbs with their constantly changing population, bringing with it all those social problems of poverty, crime and disease with which urban governors were increasingly concerned in this period.<sup>29</sup>

The Bristol evidence also raises questions concerning changes in the severity and incidence of plague over time. It is unfortunate that no registers survive for suburban parishes in the plague epidemics of the 1540s and 1550s, but the central parishes may have suffered relatively more severely than in later outbreaks of the disease. For the disparity between rich and poor parishes appears to have increased in the later epidemics of the period, the contrast being much clearer in 1603-4 and 1645 than in 1565 (Tables III and V). There might be two possible reasons for a change in incidence of this kind. It is possible first that the social geography of the town was changing, that the social classes were becoming more concentrated in different areas, and that the central parishes were being rebuilt while the suburbs were turning into slums. There were contemporary comments that this was happening elsewhere in this period,<sup>30</sup> but detailed work on the social geography of Bristol would be needed to substantiate the suggestion.

The alternative explanation, a decline in the virulence of the disease, could also have played some part. The experience of Christ Church parish in the epidemics of 1575 and 1603-4 certainly suggests that the milder the epidemic, the more it was concentrated in poorer areas, and the plague of 1645, in which contrasts between parishes were greater than before, may have been less severe than previous outbreaks. In eight parishes the ratios of burials in the epidemic years 1565, 1575, 1603-4 and 1645, to the normal annual average were respectively 7.8, 7.9, 7.5, and 5.9. But the latter figure is calculated from average burials for the 1630s when the population of these parishes may well have been higher than on the eve of the 1645 epidemic, after a prolonged siege and an outbreak of typhus. The Bristol evidence is inconclusive on this point.

Comparable work on the towns of Exeter and Norwich, however, has suggested a similar development in the incidence of plague from the mid-sixteenth century onwards, the concentration of mortality in suburban parishes being more conspicuous in epidemics after 1600 than before. It has also indicated a somewhat similar distribution of plague epidemics over time, although the actual dates of outbreaks do not exactly coincide.<sup>31</sup> The epidemics of the 1540s and 1550s seem to have been severe in each town. They were followed in Elizabeth's reign by two major epidemics in Exeter and three in Norwich. In the early seventeenth century there were outbreaks of declining virulence after the great plague of 1603-4, although neither town escaped as lightly as Bristol. Finally Exeter like Bristol suffered in 1643 from an epidemic, possibly of typhus, which was associated with civil war campaigns and which affected all parishes equally. Studies of other large towns would clearly be valuable as a means of testing some of the similarities to be observed here.

Equally, work along the same lines comparing burials in groups of rural parishes might suggest useful conclusions about the influence of size of settlement and transport facilities on the relative vulnerability of local communities to plague. Here, as in urban centres, plague can both be set in its social and topographical context and itself provide an index of the quality

of life in different sorts of pre-industrial society. But whatever regularities and patterns may be observed by the historian, the irregular and haphazard features of the history of plague evident among the households of Christ Church parish and in the timing of major outbreaks in Bristol must also be remembered when considering its impact. For contemporaries the only obvious rules governing plague, apart from its tendency to concentrate among the poor, were cosmic and supernatural ones. The plague of 1565 might have been foreseen because it was preceded by 'red beams in length like the pole, and also fire like a Furnace' in the heavens; while in 1626 the inhabitants of Bristol felt themselves threatened by the divine scourges of 'Pestilence, famine and the sword' all at once, and the minister of St. Philip's based homilies on the town's 'miraculous' deliverance from the former for years afterwards.<sup>32</sup> The local incidence of bubonic plague was of more than demographic significance for the social history of sixteenth-and seventeenth-century towns.

### Notes

1. *Local Population Studies*, 9, Autumn 1972. pp. 10-21.
2. The registers of St. James, St. Mary Redcliffe and St. Werburgh are still in the parish churches; that of Temple is also in St. Mary Redcliffe; the registers of All Saints, St. Nicholas, St. Philip and Jacob, St. Stephen, Christ Church, St. Ewen and St. John Baptist are in the Bristol Archives Office (hereafter B.A.O.). The register of St. Augustine's has been printed by the Bristol and Gloucestershire Archaeological Society (Records Section, iii, 1956).
3. R. Ricart, *The Maire of Bristowe is Kalendar*, ed. L. Toulmin Smith (Camden Soc., New Series, v, 1872), p.53; 'Two Bristol Calendars', ed. A.E. Hudd, *Trans. of the Bristol and Glouc. Arch. Soc.*, xix (1894), 140-1; *Adams' Chronicle of Bristol*, ed. F.F. Fox, 1910, p.100.
4. As Dr. Schofield has pointed out (*LPS* 9, p. 11), the selection of years from which to calculate the 'normal' annual average presents problems. Since the later part of this article tries to measure differences in the severity of epidemics between parishes, the inclusion of an epidemic year in any moving average seems inadvisable, for it would reduce the relevant contrasts. An attempt has therefore been made in what follows to take the average for a run of years close to the epidemic which did not contain fluctuations in mortality, and of course the same years have been taken for each parish. This should permit fair comparisons between parishes in a single epidemic year. But for the reasons Dr. Schofield gives, any comparison between different crisis years on the basis of these figures is more suspect, since rising or declining population trends may affect the relationship between the chosen 'average' and the exceptional year.
5. The chantry returns for Bristol are printed in E.E. Williams, *The Chantries of William Canynges in St. Mary Redcliffe Bristol*, 1950, Appendix pp. 32-41.
6. 'Two Bristol Calendars', p. 134; *Adams' Chronicle*, p. 178; Ricart, *Kalendar*, p. 59.
7. J.C. Russell, *British Medieval Population*, 1948, pp. 46,50; B.Little, *The City and County of Bristol*, 1954, p. 325; J. Latimer, *Annals of Bristol in the Seventeenth Century*, 1900, p.34.
8. B.A.O., Mayors' Audits 1624-5, p. 45, 1625-6, pp. 97, 165; Common Council Proceedings 1608-27, ff. 128v, 134v, 1627-42, ff. 25, 69r, 70v, 77r.
9. B.A.O., Mayors' Audits 1624-5, p.35; Temple Wardens' Accounts 1625, 1626. The billeting of troops in Bristol may partly account for disease in the town in 1628: Common Council Proceedings 1627-42, f.6r.

10. *Ibid.*, f. 84r; Temple Wardens' Accounts 1637; St. Mary Redcliffe Church, Churchwardens' Accounts, May 1637.
11. B.A.O., Mayors' Audits 1640-1, pp. 109-11; 1641-2, pp. 161-3; 1642-3, p. 243; Common Council Proceedings 1627-42, f. 123v.
12. *The Tragedy of the Kings Armies Fidelity since their entring into Bristol*, 1643, p. 6. Cf. E. Greaves, *Morbus Epidemius Anni 1643 or the New Disease*, 1643, pp. 11-12.
13. Cf. Clarendon, *History of the Rebellion*, ed. Macray, iv. 47; (Anon.) *The Sieges of Bristol during the Civil War*, 1868. The parish registers of All Saints, St. Stephen's and Temple all referred to 'plague' in 1645; they had not done so in 1643.
14. PRO E 179/247/6, E 179/113/192.
15. Cf. *The Inhabitants of Bristol in 1696*, ed. E. Ralph and M.E. Williams (Bristol Record Soc., xxv, 1968), p. xxiv.
16. Cf. T.H. Hollingsworth, *Historical Demography*, 1969, p. 365; R. Pollitzer, *Plague*, 1954, pp. 486-7, 494-5.
17. *Bristol and its Adjoining Counties*, ed. C.M. MacInnes and W.F. Whittard, 1955, Map, p. 23; E.M. Carus-Wilson, *Medieval Merchant Venturers*, 2nd edn. 1967, p.4. I have been unable to see the register of St. Thomas's parish but each epidemic appears to have affected it severely: D.K. Gosling, 'The Parish Registers of the Churches of SS. Philip and Jacob and S. Thomas in Bristol' (Bristol Univ. M.A. thesis 1934), p.65.
18. *The Inhabitants of Bristol in 1696*, p. xii; Carus-Wilson, *Medieval Merchant Venturers*, p. 75; *Antiquities of Bristow in the Middle Centuries*, ed. J. Dallaway, 1834, p. 145. Cf. the large sums spent annually on the poor in St. Mary Redcliffe: St. Mary Redcliffe Church, Churchwardens' Accounts 1588-98 *passim*; B.A.O., Quarter Sessions Book 1642-3, f. 201r.
19. Cf. Pollitzer, *Plague*, pp. 578-80; L.F. Hirst, *The Conquest of Plague*, 1953, pp. 294-5.
20. W. Camden, *Britannia*, ed. E. Gibson, 1722, i. 94. Cf. Carus-Wilson, *Medieval Merchant Venturers*, p. 11; Ricart, *Kalendar*, p. 47.
21. B.A.O., Grand Jury Presentments 1628-66, 28 April 1629 and *passim*.
22. B.A.O., Easter Books of Christ Church Central. All communicants were expected to contribute and the collectors listed their names household by household along each street. But it is not always possible to tell at which end of the street they began, nor in the case of the Pithay and Tower Lane, on which side.
23. B.A.O., Mayors' Audits, 1595-6; *Adams' Chronicle*, pp. 149, 153.
24. It is surprising that there was no rise in the number of burials in St. James's Parish, but the register appears to be defective in 1597-9.
25. On the possibility of typhus spreading beyond the poor once it has become epidemic, see W.P. MacArthur, 'The Medical History of the Famine' in *The Great Famine*, ed. R.D. Edwards and T.D. Williams, 1956, pp. 278-80.
26. J.D. Chambers, *Population, Economy and Society in Pre-industrial England*, 1972, ch. 4.
27. The shortage of corn in Bristol at the end of 1550 is mentioned in B.L.Lansdowne MS. 2, f. 91.
28. Over the period 1605-39 there were 169 baptisms for every 100 burials in St. Nicholas's parish and 119 in St. Mary Redcliffe, for example.
29. Cf. B.A.O., Common Council Proceedings 1608-27, f. 124v; Quarter Sessions Book 1620-9, f. 76v.
30. E.g. in Norwich: W. Rye, *Depositions taken before the Mayor and Aldermen of Norwich 1549-67*, 1905, p. 70.



31. See my forthcoming book, *The Impact of Plague in Tudor and Stuart England*.
32. *Adams' Chronicle*, pp. 178, 216-7; S. Seyer, *Memoirs Historical and Topographical of Bristol*, 1821-3, i. 274-5.

